



The Parker Ranch installation in Hawaii

**Green building codes, standards
and programs**

J.C. Martel, Michelle Britt, Curtis Framel

Southwest Energy Efficiency Project
Pacific Northwest Laboratory

- Webinar Platform and Process
- What is the Technical Assistance Program

What is TAP?

DOE's Technical Assistance Program (TAP) supports the Energy Efficiency and Conservation Block Grant Program (EECBG) and the State Energy Program (SEP) by providing state, local, and tribal officials the tools and resources needed to implement successful and sustainable clean energy programs.



TAP offers:

- One-on-one assistance
- Extensive online resource library, including:
 - Webinars
 - Events calendar
 - TAP Blog
 - Best practices and project resources
- Facilitation of peer exchange

On topics including:

- State and local capacity building
- Energy efficiency and renewable energy technologies
- Program design and implementation
- Financing
- Performance contracting

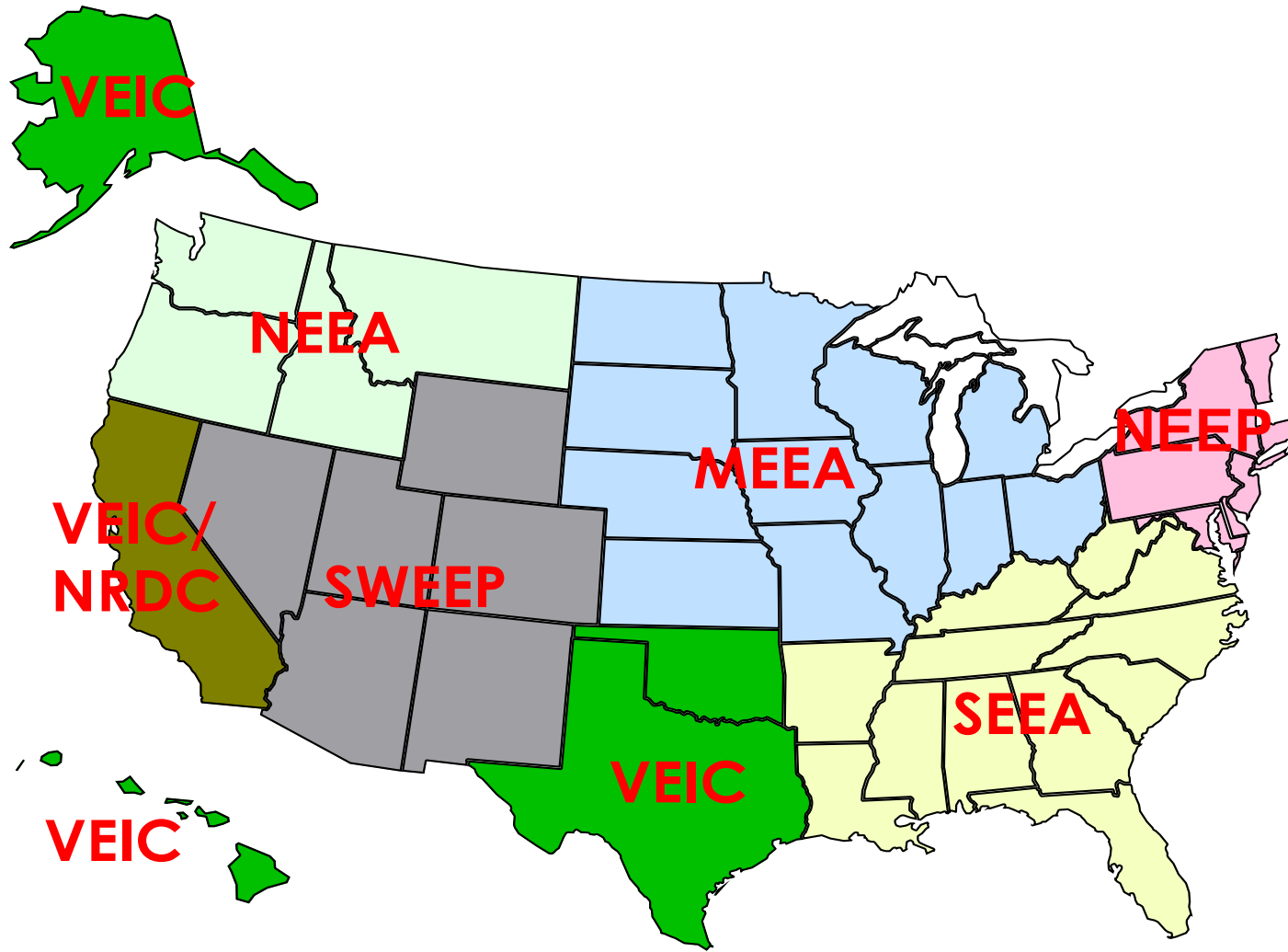
Provider Network Resources

State and Local Capacity Building	<ul style="list-style-type: none">• Trainings• Workshops• Peer-to-peer matching
Technical	<ul style="list-style-type: none">• Renewable energy siting and development• Review of technical specs for RFPs• Strategic planning, energy management, and conservation strategies• Green building technologies• Building codes
Program Design and Implementation	<ul style="list-style-type: none">• Policy and program development• Coordinating rate-payer funded dollars with ARRA projects and programs• Sustainable community and building design• State and regional EE and RE assessments and planning• EE and RE portfolio program design elements
Financial	<p>Program design support and guidance on financing mechanisms such as:</p> <ul style="list-style-type: none">• Revolving loan funds (RLFs)• Property-assessed clean energy (PACE)• Loan loss reserves and enhanced credit mechanisms
Performance Contracting	<ul style="list-style-type: none">• Designing and implementing a performance contract• Leveraging private investment• Reducing institutional barriers• Tracking and comparing programs

Who We Are: Team 4

U.S. DEPARTMENT OF
ENERGY

Energy Efficiency &
Renewable Energy



NORTHWEST
ENERGY
EFFICIENCY
ALLIANCE



ACEEE, NRDC: National Support

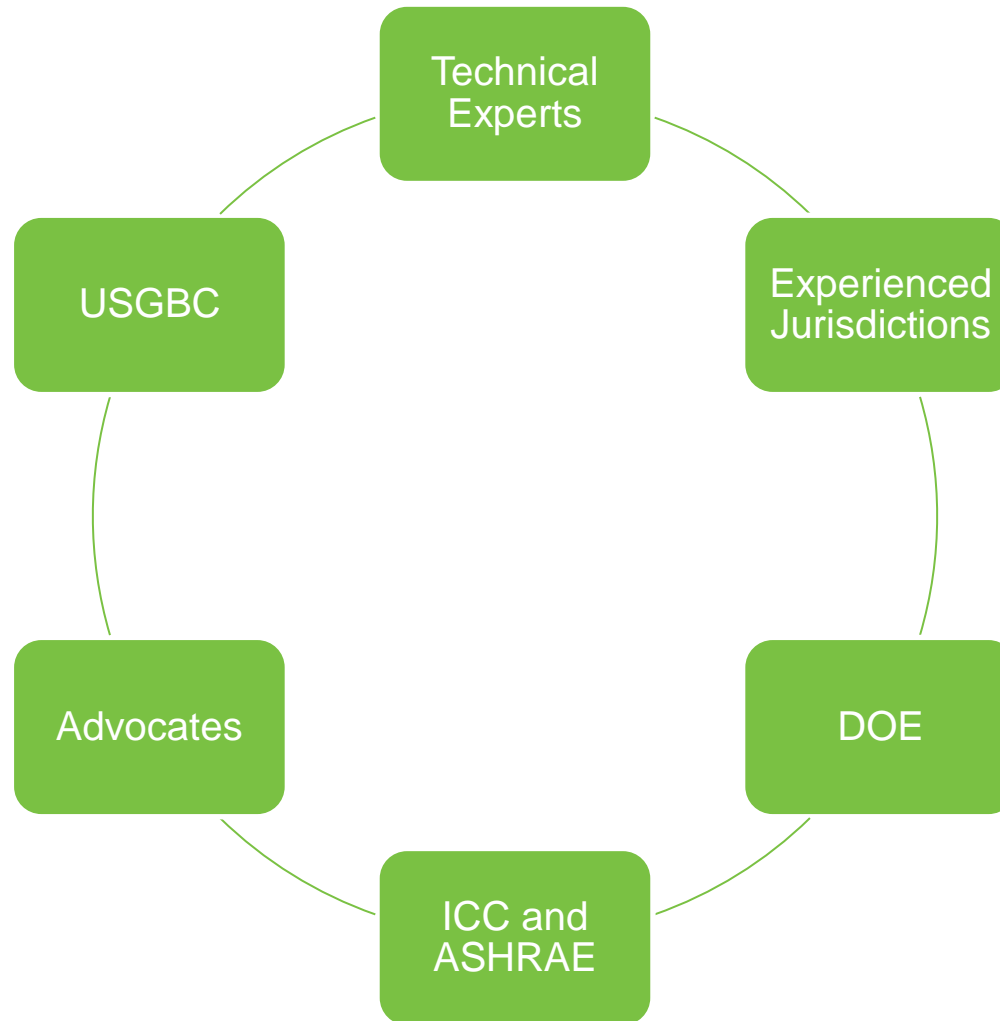
- Gain a general understanding of the purpose of green codes, standards, and programs
- Understand your options if you are looking for a green building program for your organization, agency, state, or community

Background/Overview

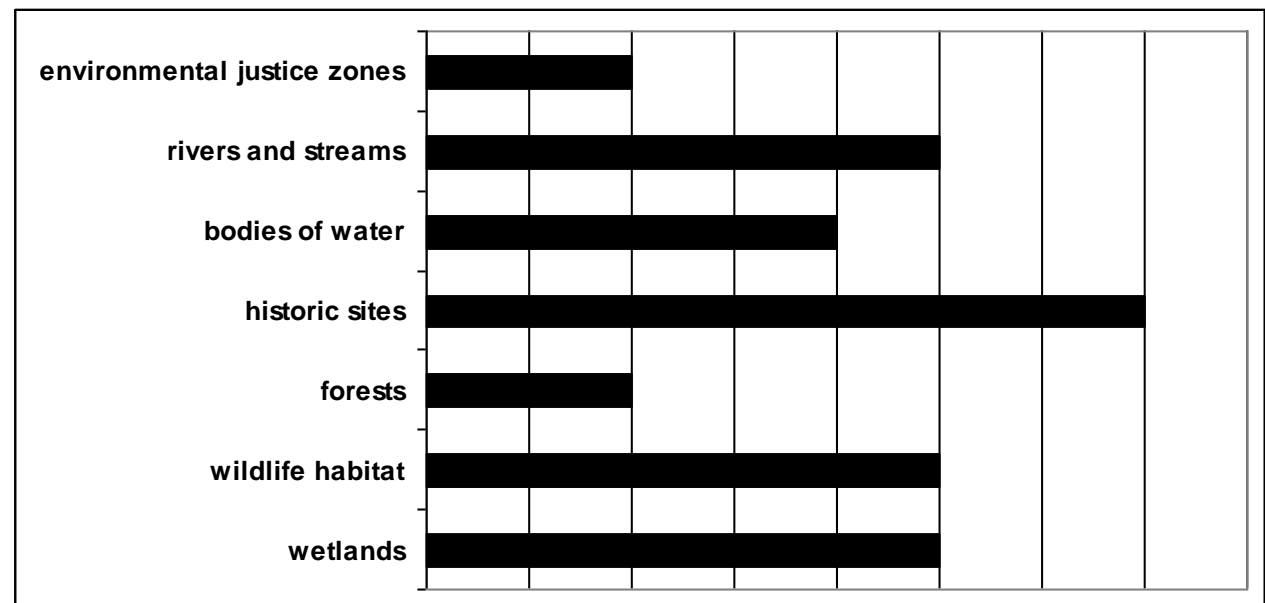
Comprehensively Address How the Development Occurs,
and Buildings are Designed and Constructed

- Site sustainability
- Water use efficiency
- Energy efficiency
- Indoor environmental quality, and
- Materials and resources

Green Building Code Development – A National, Collaborative Effort



- How do green building programs interact with zoning ordinances?
- What are the steps to coordinating government agencies on a green building program?



Site Development and Land Use –

- ❑ planning and zoning checklists, third party verification, registered design professionals (e.g. site inventories, landscaping), document review

Example from IgCC PV1

- ❑ 402.2.5 Agricultural land. Where this section is indicated to be applicable in Table 302.1, buildings and associated site improvements shall not be located on land zoned for agricultural purposes.
 - ❑ Exception: Buildings and associated site improvements shall be permitted to be located on agriculturally zoned land where the building serves an agriculturally related purpose, including, but not limited to, farm produce storage, processing and shipping.

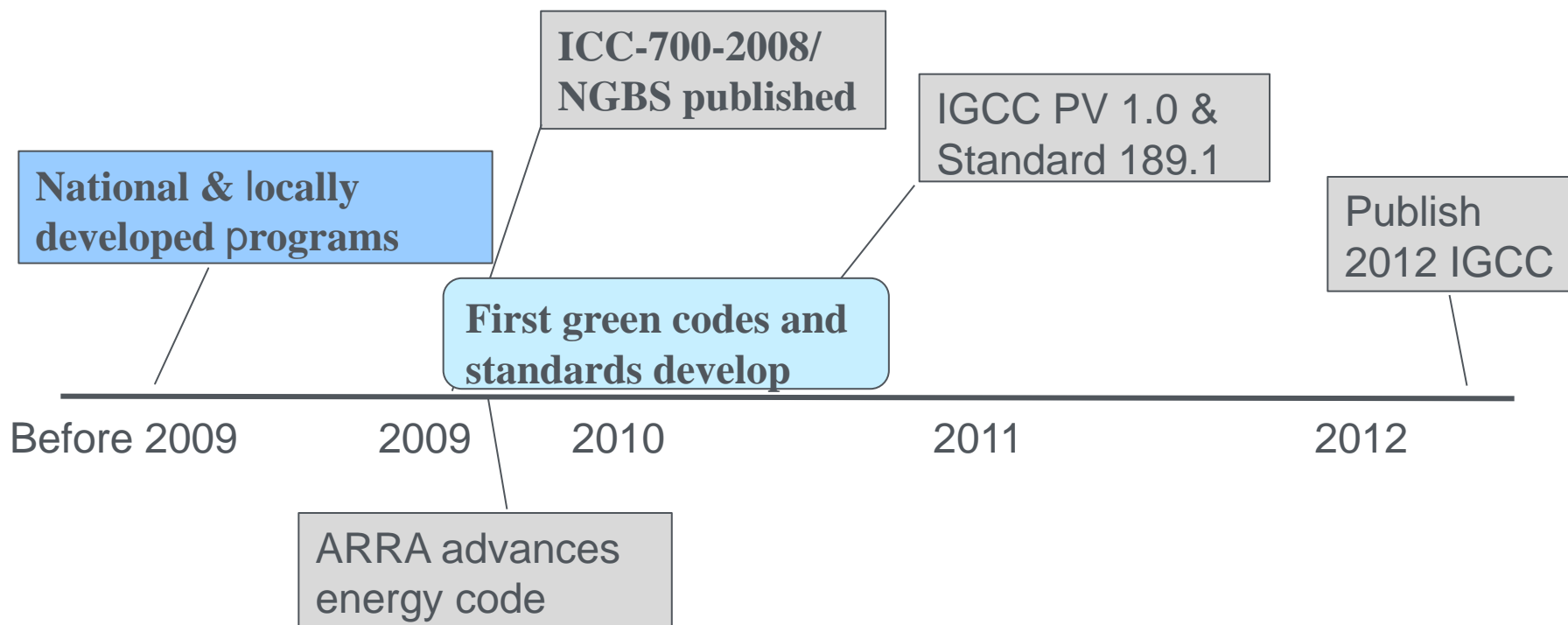
Material and Waste Management–

- ❑ Building department checklists, document review (e.g. construction waste management plan)

Example from IgCC PV1

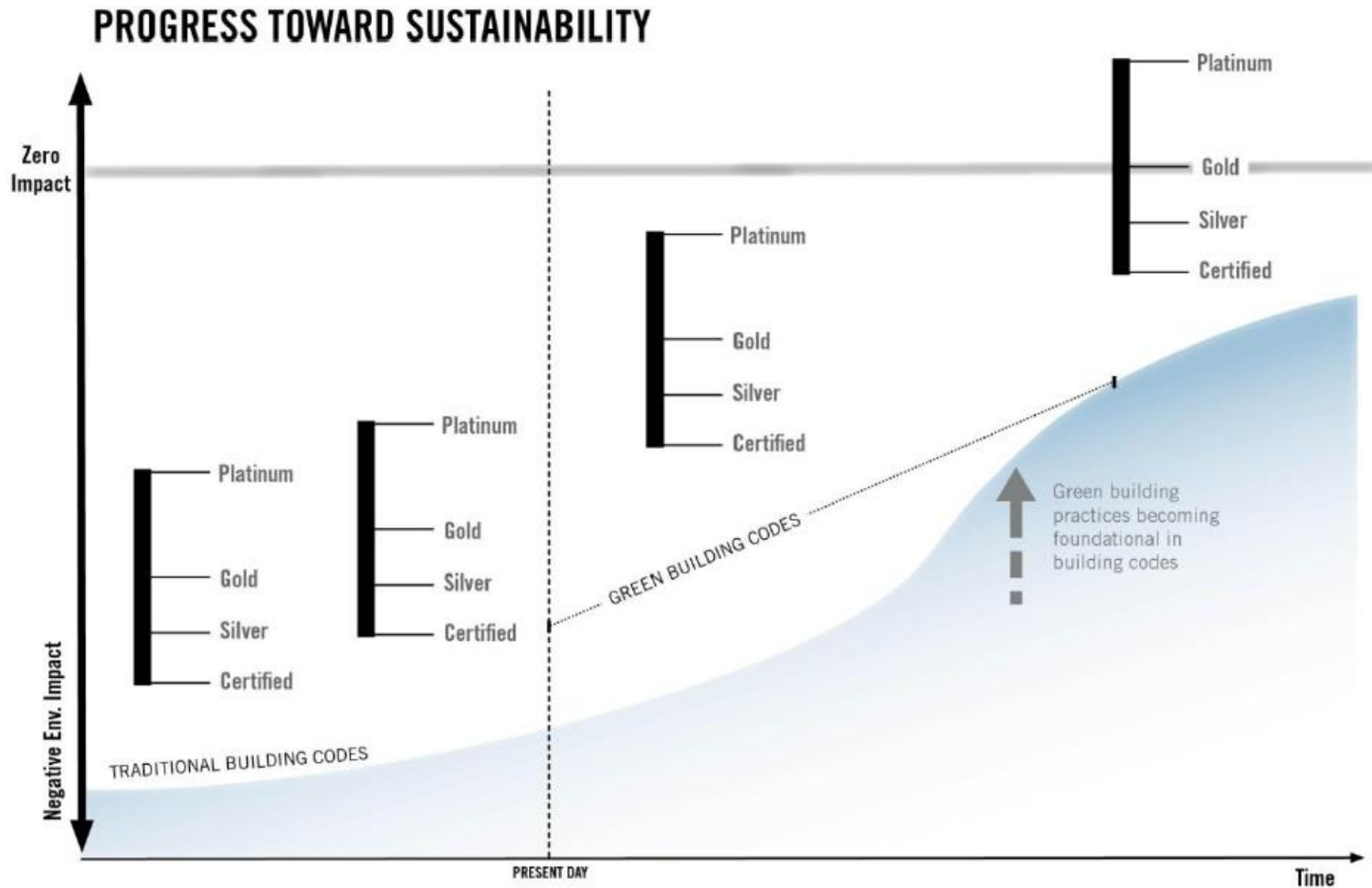
- ❑ 505.1 Building service life plan. A building service life plan (BSLP) in accordance with this section shall be included in the construction documents. The design service life shall be not less than 60 years and the BSLP shall indicate the design service life selected for the building.
 - ❑ Exception: Where justified by community development plans and approved by the code official, a BSLP of 25 years shall be permitted. A BSLP of 25 years shall be comprised of a dismantling, de-mounting, and re-use plan.

Recent Activity in the Green Building Program & Code Arena



Examples of programs: LEED, Green Points, Built Green, Earth Advantage, Green Globes

ACRONYMS:
ICC-700/NAHB National Green Building Standard
International Green Construction Code
ASHRAE/USGBC/IES Standard 189.1-2009



From USGBC document, "Greening the Codes." <http://www.usgbc.org/ShowFile.aspx?DocumentID=7403>

Jurisdiction decides if the program is voluntary or mandatory. The builder can decide if they want to use the prescriptive or performance-based compliance path.



Mandatory

or



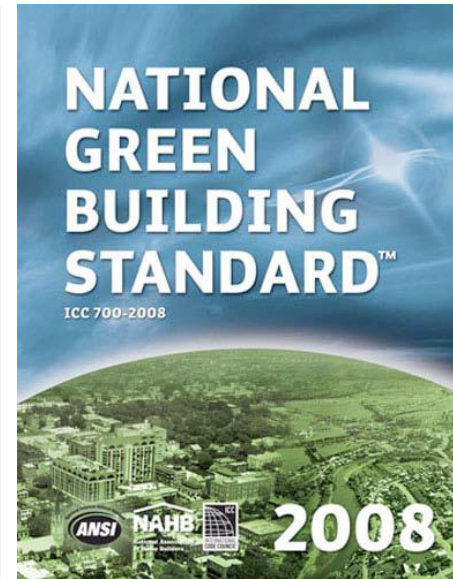
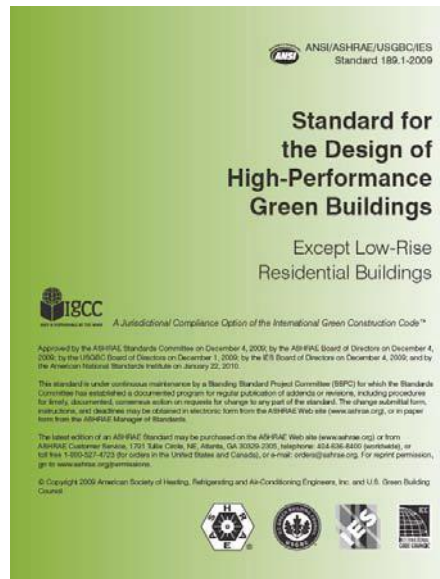
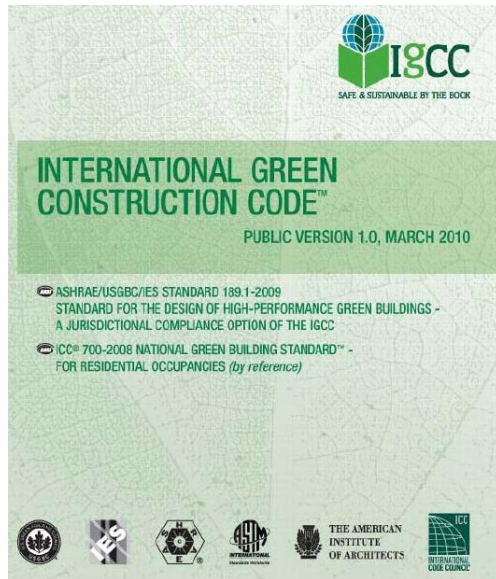
Voluntary

Recently Developed Codes, Standards, Programs

Codes, Standards, Programs and Resources

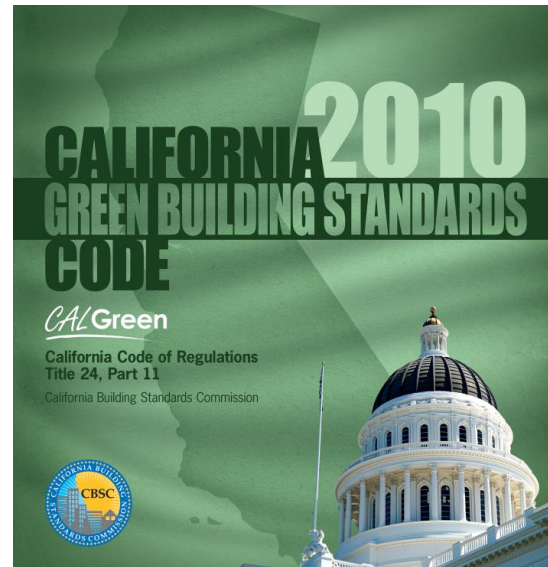
U.S. DEPARTMENT OF
ENERGY

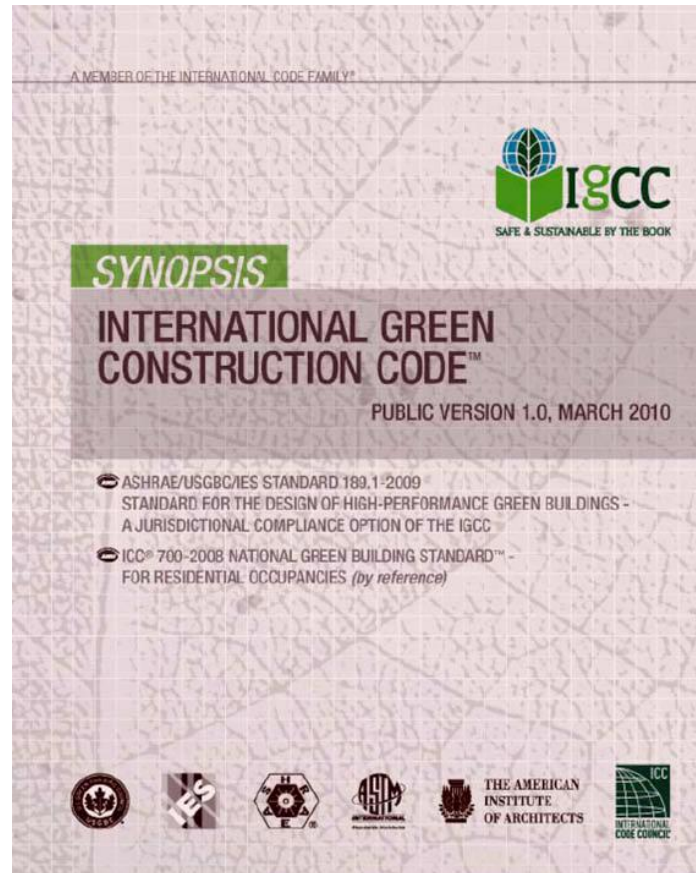
Energy Efficiency &
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LEED 2009 3
NEW
CONSTRUCTION
& MAJOR RENOVATIONS

For Public Use and Display
LEED 2009 for New Construction and
Major Renovations Rating System
USGBC Member Approved November 2008 (Updated July 2014)





Read the 33 page SYNOPSIS first. Available for free download at <http://media.iccsafe.org/IGCC/docs/IGCC-Synopsis.pdf>

OVERLAY CODE: *From the IGCC-The IGCC is not to be used as a stand alone construction regulation document or to abridge or circumvent safety, health or environmental requirements under other codes, such as the International Building Code and the International Fire Code.*



Integrated adoption process including, by reference:



TABLE 302.1
REQUIREMENTS DETERMINED BY THE JURISDICTION

Section	Section Title or Description and Directives	Jurisdictional Requirements	
CH 1. ADMINISTRATION			
102.4.12 302.1 (1)	ICC 700 Environmental Performance Level - Select one box.	<input type="checkbox"/> Bronze <input type="checkbox"/> Silver <input type="checkbox"/> Gold <input type="checkbox"/> Emerald	
CH 3. JURISDICTIONAL REQUIREMENTS AND PROJECT ELECTIVES			
302.1 (2)	Optional compliance path – ASHRAE 189.1	<input type="checkbox"/> Yes	<input type="checkbox"/> No
302.1 (3)	Project Electives – The <i>jurisdiction</i> shall indicate a number between 0 and 14 to establish the minimum total number of <i>project electives</i> that must be satisfied.	_____	
CH 4. SITE DEVELOPMENT AND LAND USE			
402.2.1.2	Floodplain preservation	<input type="checkbox"/> Yes	<input type="checkbox"/> No
402.2.3	Conservation area	<input type="checkbox"/> Yes	<input type="checkbox"/> No
402.2.5	Agricultural land	<input type="checkbox"/> Yes	<input type="checkbox"/> No
402.2.6	Greenfields	<input type="checkbox"/> Yes	<input type="checkbox"/> No

.....Plus req's for water, energy, indoor air quality, materials, etc.

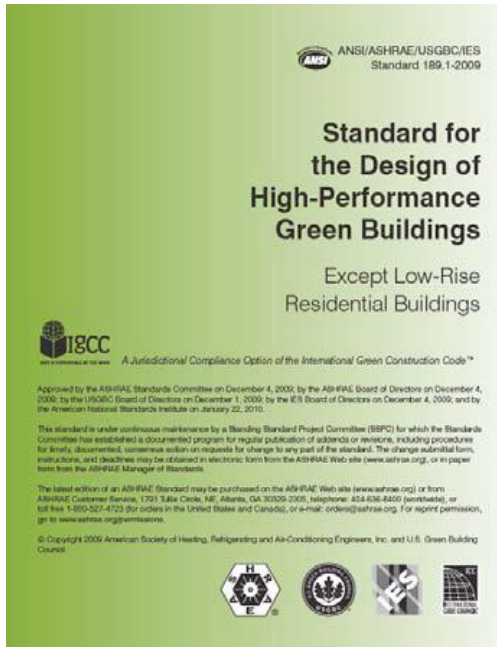
PROJECT ELECTIVES CHECKLIST

Section	Description	Check the corresponding box to indicate each <i>project elective</i> selected.
CH 3. JURISDICTIONAL REQUIREMENTS AND PROJECT ELECTIVES		
304.1	Whole Building Life Cycle Assessment	<input type="checkbox"/>
CH 4. SITE DEVELOPMENT AND LAND USE		
407.2.1	Flood hazard avoidance	<input type="checkbox"/>
407.2.2	Agricultural land	<input type="checkbox"/>
407.2.3	Infill site	<input type="checkbox"/>
407.2.4	Brownfield site	<input type="checkbox"/>
407.2.5	Greenfield development	<input type="checkbox"/>
407.2.6	Greenfield proximity to development	<input type="checkbox"/>
407.2.7	Greenfield proximity to diverse uses	<input type="checkbox"/>
407.3.1	Changing and shower facilities	<input type="checkbox"/>
407.3.2	Long term bicycle parking and storage	<input type="checkbox"/>
407.3.3	Preferred parking	<input type="checkbox"/>
407.4.1	Site hardscape 1	<input type="checkbox"/>

Like rating systems, the jurisdiction can set thresholds and require a # of project electives. Jurisdiction chooses 0-14 electives and designer can choose out of 60.

- 30% better than IECC 2006 for energy efficiency
- 20% reduction in water use compared to the IPC
- 35% of construction phase waste materials diverted from landfills

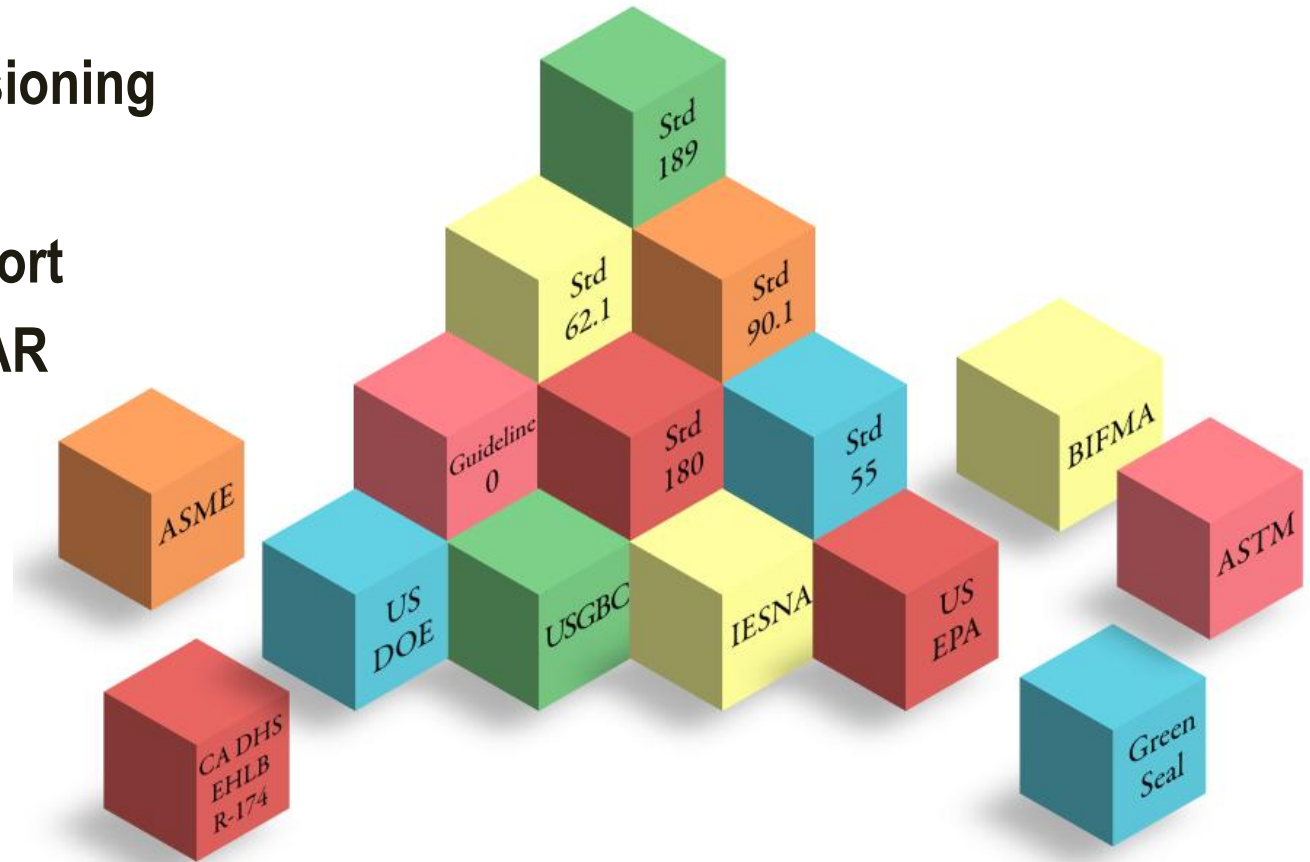




- Consensus process with 4 public reviews, started in 2006 then published Jan. 2010
- Developed in partnership between ASHRAE, USGBC, ICC and IES
- For nonresidential spaces and residential more than three stories
- Optional compliance path for the IGCC
- Mandatory req's for each topic ensures appropriate building science

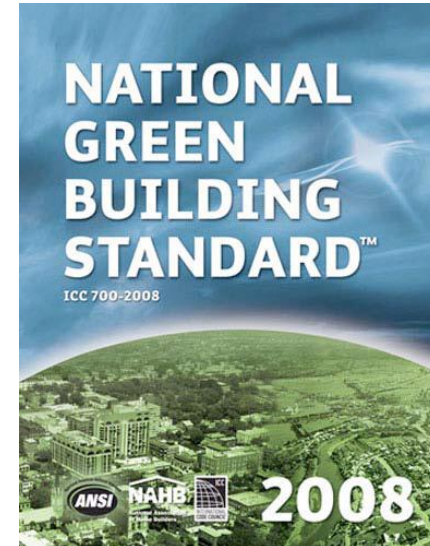
Standard 189.1 Building Blocks

Std 62.1 Ventilation
Guideline 0 Commissioning
Std 90.1 Energy
Std 55 Thermal Comfort
US EPA ENERGY STAR
Std 180 HVAC

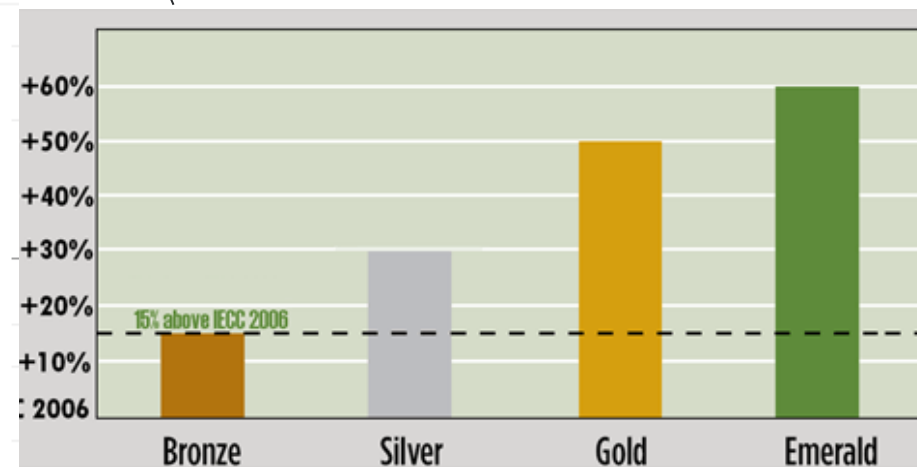


Graphic from presentation by Kent W. Peterson
<http://www.engineeringforsustainability.org/>

Threshold Point Ratings for Green Buildings						
Green Building Categories			Performance Point Levels (1) (2)			
			BRONZE	SILVER	GOLD	EMERALD
1.	Chapter 5	Lot Design, Preparation, and Development	39	66	93	119
2.	Chapter 6	Resource Efficiency	45	79	113	146
3.	Chapter 7	Energy Efficiency	30	60	100	120
4.	Chapter 8	Water Efficiency	14	26	41	60
5.	Chapter 9	Indoor Environmental Quality	36	65	100	140
6.	Chapter 10	Operation, Maintenance, and Building Owner Education	8	10	11	12
7.		Additional Points from any category	50	100	100	100
Total Points			222	406	558	697

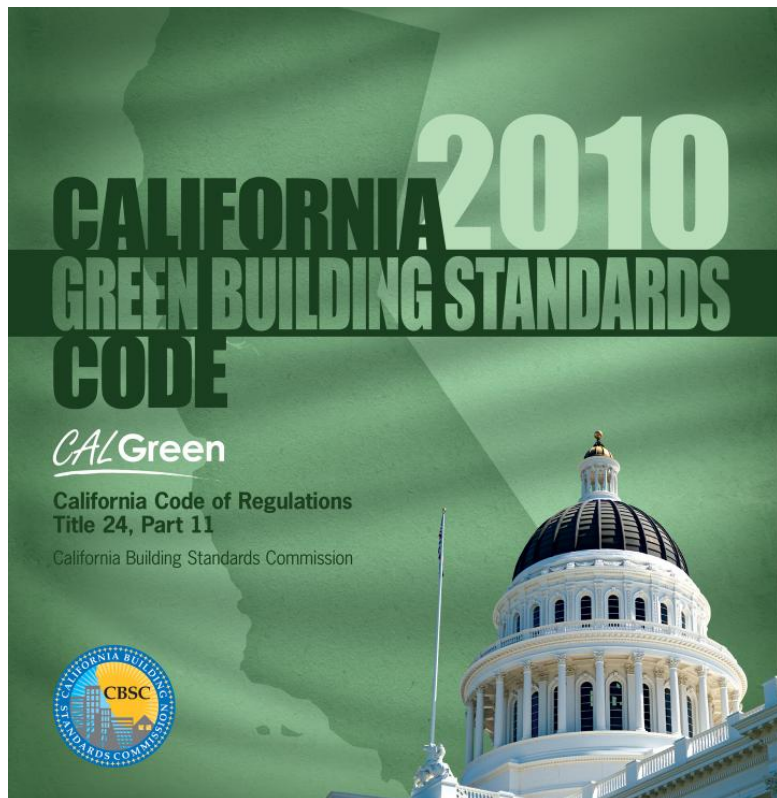


The more points accrued, the higher the score. Use the free web-based or excel spreadsheet Green Scoring Tool to identify score. www.nahbgreen.org



<http://www.nahbgreen.org/Guidelines/ansistandard.aspx>

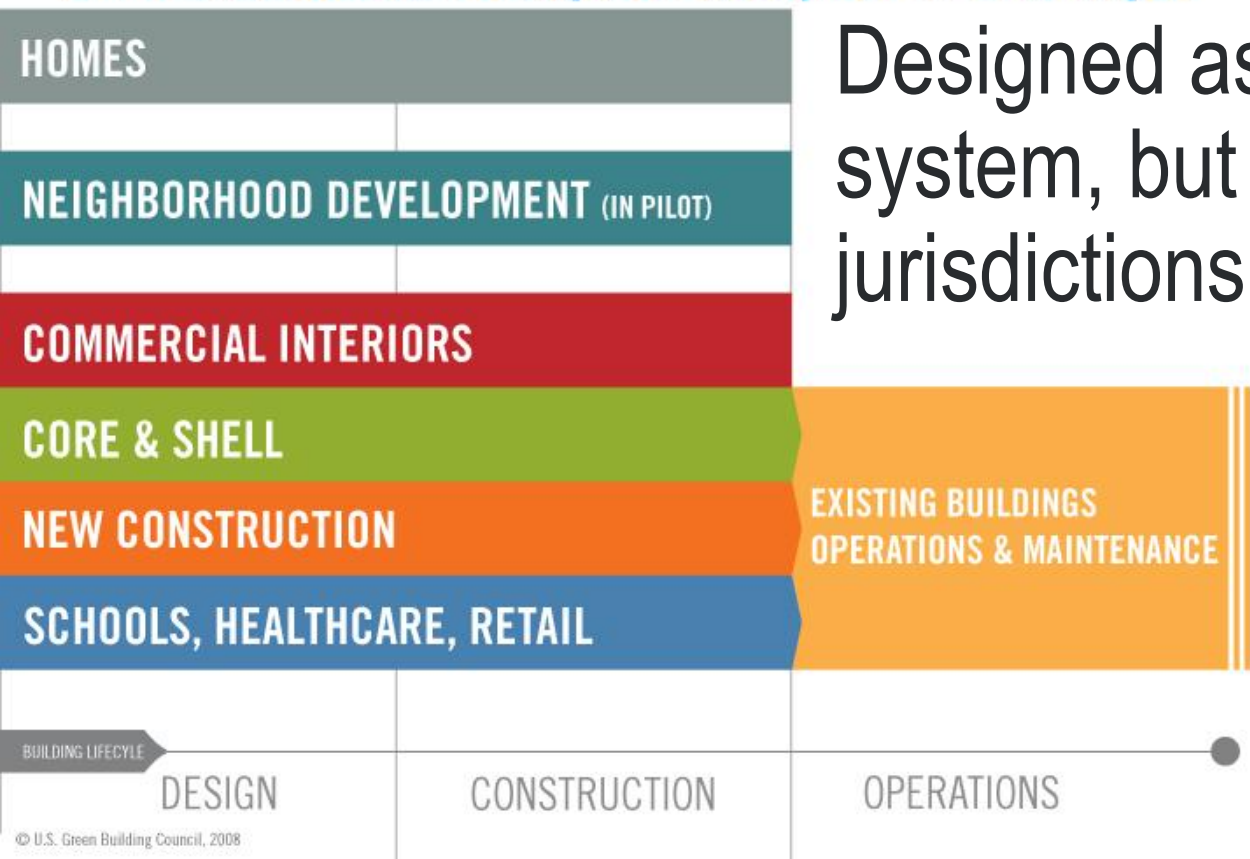
CALGREEN— Cali. first state to adopt a statewide green building code



- Strategy to reach 1990 carbon emissions levels by 2020
- Takes effect Jan.1, 2011
- Mandatory provisions; local jurisdictions can go above

LEED – Beyond Code Rating System

LEED address the complete lifecycle of buildings:



Designed as voluntary rating system, but used in some jurisdictions as mandatory

Case Studies

- 1980's Energy Option Program (*voluntary energy & water conservation*)
- 1996 Green Points (*mandated for new construction*)
- 2001 Update (*mandated for remodels & additions*)
- 2008 Update (*mandated waste diversion and above Energy Code efficiency standards*)
- 2009 Update (*mandated above energy codes efficiency standards for residential additions and remodels and thresholds for new construction energy efficiency standards for larger additions*)

- Basic compliance with ICC 700 is accomplished by accumulating the necessary number of points **to achieve the Bronze Level** (222 points from table 303 of the NGBS)
- Builders and homeowners can **voluntarily go above the minimum** by accruing more points using the scoring tool.
- A Jurisdiction could determine the minimum threshold for any category.

1. Bring together all the stakeholders, including those opposed to any change
2. Identify your goals
 - Goal 1. National Code/Standard/Program
 - Goal 2. Flexibility for Jurisdictions
3. Provide education on the options available that meet those goals
4. Work within the jurisdiction to identify clear paths for adoption/compliance and enforcement.
5. Provide education for staff and the local design and building community

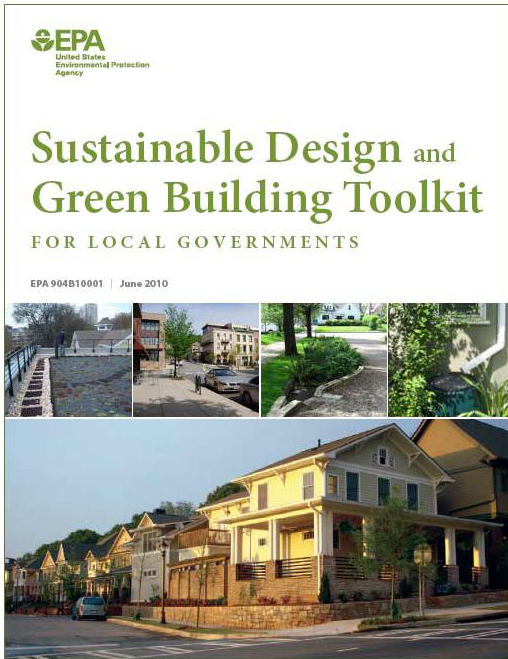
Resources

1. Adopt one of the new nationally developed and vetted programs.
2. Adopt one of the well established third party verification programs
 1. Earth Craft, Earth Advantage, Green Globes
3. Develop a local or regional program specifically tailored to your community.
 1. Examples – Marin County, CA, Pima County, AZ
4. Combination

Development Standard. Public and private development that requires a Development Site Plan (DSP) or Development Special Use Permit (DSUP) should achieve the following green building standard:

1. *Non-Residential: LEED Silver.*
2. *Residential: LEED Certified, LEED for Homes, or ANSI/ICC-700 2008 National Green Building Standard.*
3. *Mixed use: Each component should follow the applicable rating standard.*
4. *Coordinated Development Districts: Approvals for CDD areas yet to be developed will incorporate these standards.*

In each case, applicable ENERGY STAR systems should be incorporated.



**Released June 2010
For Region 4 (Southeast)**

There are two sections to the Toolkit: the first section is an **Assessment Tool and Resource Guide**. The second section is a guide to developing an **Action Plan** for implementing changes within a community's permitting process.

Six Steps to Creating the Action Plan:

1. Establish Priorities
2. Conduct an Internal Situation Assessment
3. Conduct an External Situation Assessment
4. Design the Plan
5. Implement the Plan
6. Conduct an Evaluation

<http://www.epa.gov/region4/recycle/green-building-toolkit.pdf>

A.1.1 Do the codes/ordinances: Provide for preservation or protection of critical natural resources such as: streams, wetlands, floodplains, critical wildlife habitat, steep slopes, and drinking water sources?

Specific Question and Potential Tools and Techniques

Assessment of Specific Question

a) Do the codes/ordinances provide for a river and stream buffer to protect water quality and habitat in streams and rivers?

POTENTIAL TOOLS AND TECHNIQUES:

- *Buffer ordinances.*
- *Buffer design requirements (width, vegetation, maintenance).*
- *Stormwater credits.*

G ☐ Required by code/ordinance
☐ Incentivized

Y ☐ Expressly allowed
☐ Code/ordinance silent, but typically allowed

R ☐ Code/ordinance silent, but not typically approved
☐ Expressly prohibited

b) Do the codes/ordinances for the river and stream buffer include lakes, wetlands, and coastal waters to protect water quality and habitats in these waters?

POTENTIAL TOOLS AND TECHNIQUES:

- *Buffer ordinances.*
- *Buffer design requirements (width, vegetation, maintenance).*
- *Stormwater credits.*

G ☐ Required by code/ordinance
☐ Incentivized

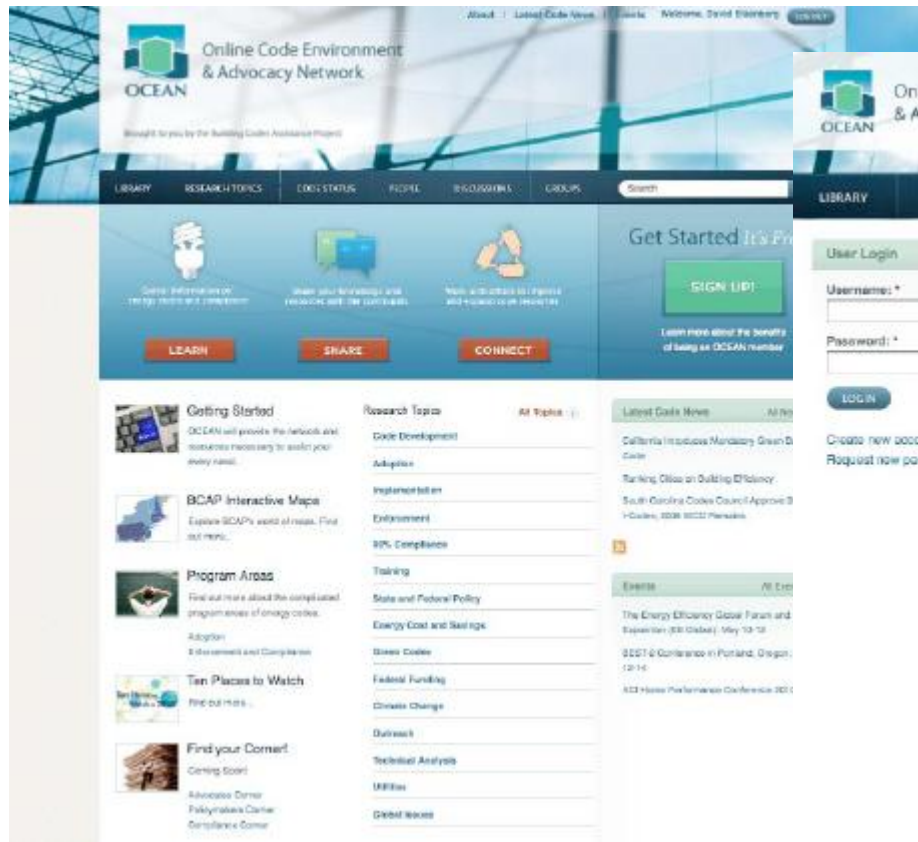
Y ☐ Expressly allowed
☐ Code/ordinance silent, but typically allowed


R ☐ Code/ordinance silent, but not typically approved
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National Listing

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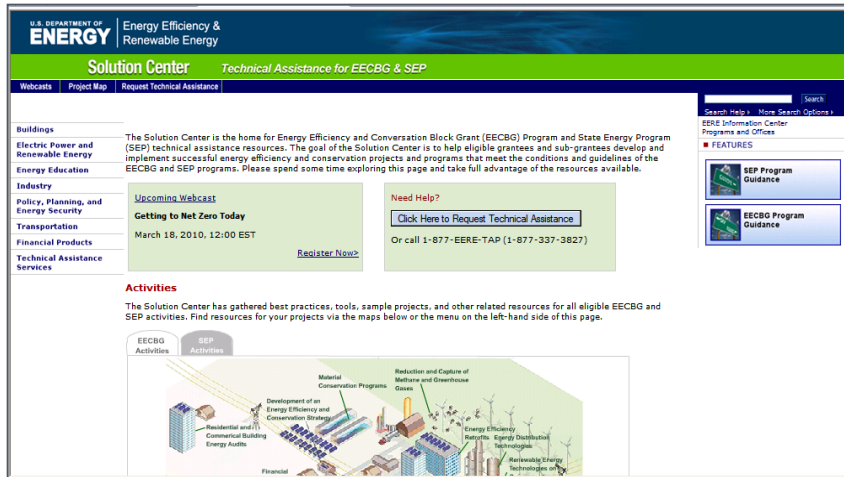




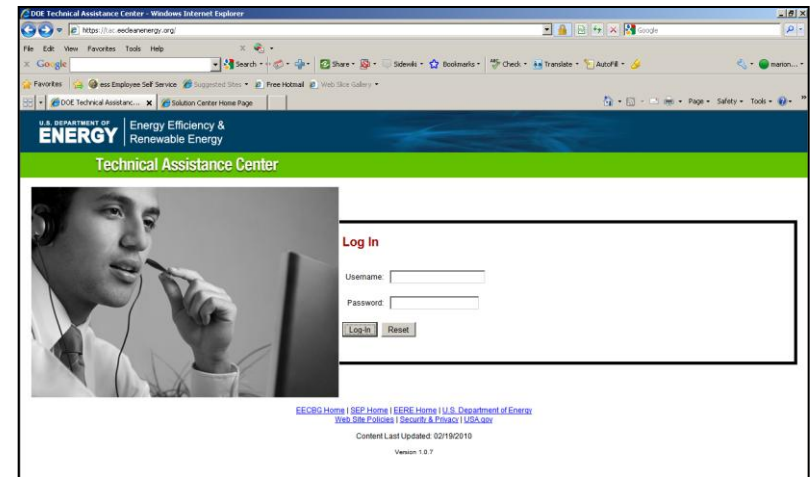
- Learning from Each Other - Network
- DSIRE, dsireusa.org
- Greenbuild, greenbuildexpo.org
- International Code Council, iccsafe.org
- ASHRAE, engineeringforsustainability.org
- U.S. Green Building Council, usgbc.org
- *SWEEPs Going Beyond Code: A Guide to Creating Energy Efficient and Sustainable Buildings in the Southwest.*
<http://www.swenergy.org/programs/buildings/codes/beyondcode/>
- National Catalog of Beyond Codes Adopted - <http://bcap-ocean.org/resource/national-listing-above-code-high-performance-and-green-building-programs>

We encourage you to:

1) Explore our online resources
via the [Solution Center](#)



2) Submit a request via the
[Technical Assistance Center](#)



3) Ask questions via our call center at
1-877-337-3827 or email us at
solutioncenter@ee.doe.gov

CONTACTS

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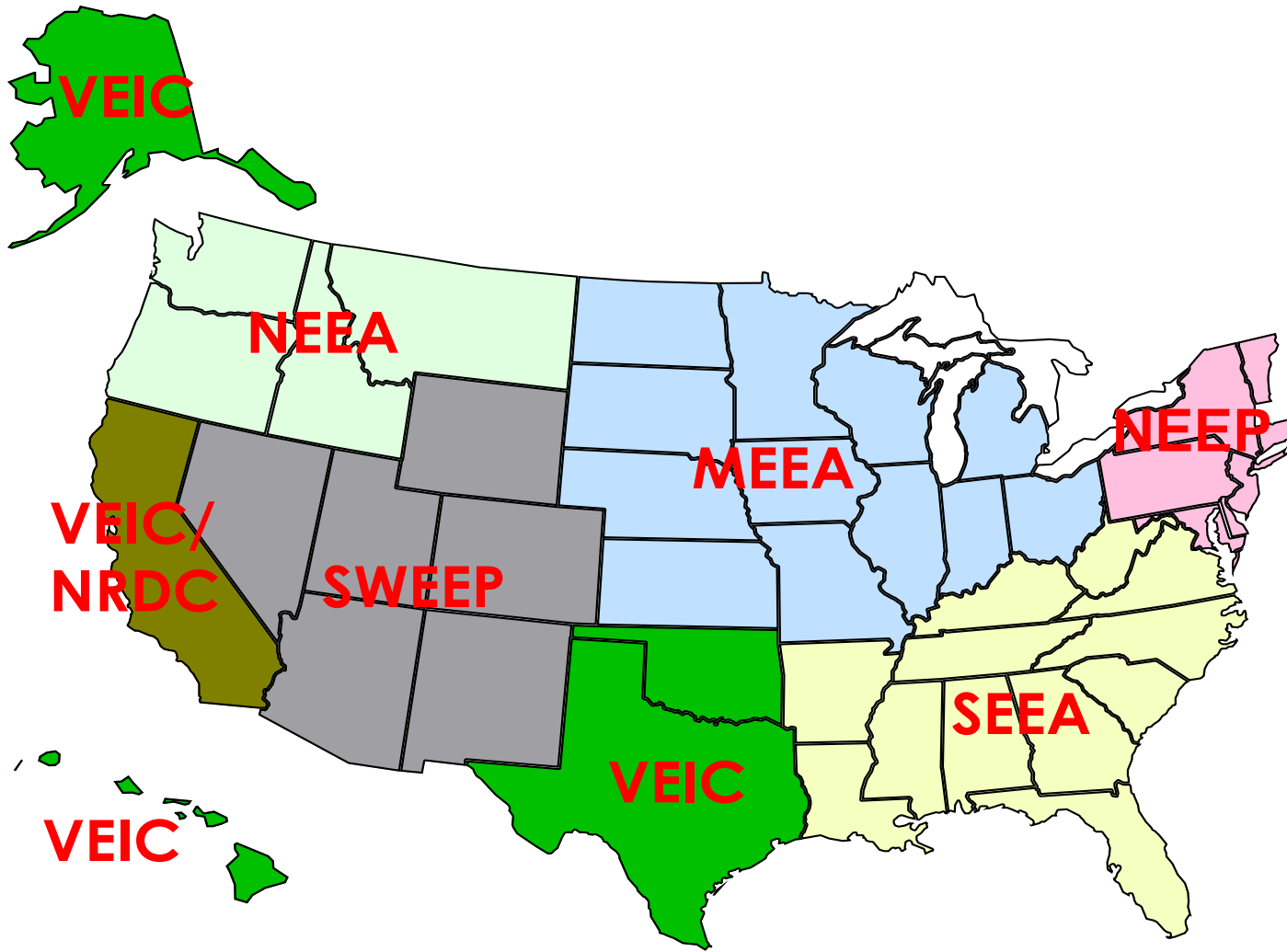
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Who We Are: Team 4

U.S. DEPARTMENT OF
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Energy Efficiency &
Renewable Energy



NORTHWEST
ENERGY
EFFICIENCY
ALLIANCE



ACEEE, NRDC: National Support

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QUESTIONS?



Please join us again:

Title: **“Green” Codes and Programs**

Host: J.C. Martel, Southwest Energy Efficiency Alliance

Date: September 24, 2010

Time: 2:00 – 3:00 EDT

Title: **Designing Effective Renewables Programs**

Host: Cheryl Jenkins, Vermont Energy Investment Corporation

Date: September 28, 2010

Time: 2:00 – 3:00 EDT

Title: **Driving Demand for Home Energy Improvements:
Lessons from the Field**

Host: Sarah Busche, National Renewable Energy Laboratory

Date: September 29, 2010

Time: 3:00 – 4:15 EDT

Title: **Sustainable Communities and Vehicle Miles Traveled
(VMT) Reduction**

Host: Therese Langer, American Council for an Energy-Efficient
Economy, Transportation Program Director

Date: October 5, 2010

Time: 2:00-3:00 EDT

Title: **Strategies for Making Existing Buildings High
Performance**

Host: Carolyn Sarno, Northeast Energy Efficiency Partnerships,
Senior Program Manager, High Performance Buildings

Date: October 7, 2010

Time: 2:00-3:00 EDT

Title: **Energy Savings Performance Contract (ESPC) Pricing
and Financing**

Host: Meg Giuliano, ICF International

Date: October 12, 2010

Time: 1:30-2:30 EDT

Title: **Future Funding: Effective Models for Leveraging Public
Funds**

Host: Kim Wollos and Bill Prindle, ICF International

Date: October 13, 2010

Time: 12:00-1:30 EST

Title: **Energy Code Compliance and Enforcement Best
Practices**

Host: Jim Meyers, Southwest Energy Efficiency Project, Director of
Buildings Efficiency Program

Date: October 14, 2010

Time: 2:00-3:00 EST

For the most up-to-date information and registration links, please visit the Solution Center
webcast page at www.wip.energy.gov/solutioncenter/webcasts